Fact Sheet:

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GEOGRAPHIC RESOURCES ANALYSIS SUPPORT SYSTEM (GRASS)

The Problem

Land managers and training planners at Army installations face the complex tasks of 1) facilitating the best training use of range and maneuver areas; 2) maintaining land conditions suitable for long-term training use; 3) protecting valuable natural and cultural resources; and 4) accommodating secondary land uses such as forestry, grazing, hunting, and recreation. Army land management problems have been complicated by new, highly sophisticated weapons requiring larger maneuver and training range areas. To help fulfill the complex land use planning and management requirements, tools are needed to store and analyze large amounts of geographic information about the natural and built environments in and around installations.

The Technology

The U.S. Army Construction Engineering Research Laboratories (CERL) developed the Geographic Resources Analysis Support System (GRASS) to provide computerized geographic tools to Army environmental planners and land managers, as well as to Civil Works project planners and designers.

GRASS has many capabilities. It handles different data types: raster (grid cell), including satellite and aerial photographic imagery; vector (line); and point. It

uses standardized command line input and can be run under the X Window SystemTM. An internal language allows users and programmers to create custom applications and demonstration models, and to link GRASS with other software packages such as a data base management system.

New data input for a GRASS system can come from a variety of sources. Digitzers, scanners, and screen pointing with a mouse can all be used to create data. Data can be read in from CD-ROMs, computer tapes, and diskettes. Data can also be created as a result of the many different analysis programs. Common examples of GRASS output include statistical tables, text files, and maps displayed on a color monitor or printed by a printer or plotter.

Hardware configurations vary from a table-top to rack-mount machines, depending on the platform available and the needs of the users. A minimum configuration includes a display device capable of 256 simultaneous colors, a processor running UNIX or a similar operating system (including LINUX and A/UX), at least 8 megabytes of system memory, at least 140 megabytes of disk space (300 to 600 megabytes is recommended), a printer, a CD-ROM drive, a tape drive, and a mouse pointing device. Other options include a digitizer for map input, any of several color printers or pen plotters for hard copy output, and modems and/or network connections to communicate with other machines. Current GRASS workstations include Sun, Intergraph, CD 4000 machines, DEC, Tektronix 88K, Silicon Graphic's IRIS and Indigo, Data General Aviion, IBM RISC and PS/2, Hewlett Packard, Macintosh and PC 386s, 486s and Pentiums.

Benefits/Savings

GRASS allows Army environmental planners and land managers to compile extensive data on the natural and built environments at installations in order to obtain an accurate assessment of current land conditions. Data can be analyzed to gain insight to causes and potential solutions of environmental and planning problems. GRASS users can monitor environmental changes over time, and can develop models of landscape conditions and processes. Maps, computer displays, and statistical tables can be created to communicate results.

Status

GRASS has been installed at dozens of military installations and Army Corps of Engineer sites. Outside the Army, GRASS users now include federal agencies as well as many universities, state and local agencies, and commercial firms. Support for GRASS users comes from a variety of sources. Electronic mailing lists and newsgroups allow GRASS users to ask questions and share solutions with the general GRASS community via the Internet. CERL supports and distributes GRASS for U.S. military users. The Center for Remote Sensing and Spatial Analysis (CRSSA) at Rutgers University, NJ, distributes and supports GRASS for the general GRASS community. CRSSA distributes manuals, tutorials, and videos, as well as global datasets on CD-ROM. It also produces "GRASSClippings," an on-line newsletter that provides, via the World Wide Web, information about GRASS and its applications. CERL and Rutgers offer GRASS user and programmer training workshops, a schedule of upcoming courses is available from CRSSA.

CERL no longer intends to develop, support or distribute the public domain version of GRASS GIS. CERL has signed a Cooperative Research and Development Agreement (CRADA) with LAS Inc., Montreal, Quebec, Canada to transfer CERL's GRASS GIS software technology into a commercial PC/Windows environment. LAS has released a commercial, value-added version of GRASS known as GRASSLANDS, on widely used PC hardware configurations running under Windows NT and Windows 95. LAS and CERL currently have shared responsibility for the transfer of GRASS GIS products and support to the commercial market.

Points of Contact

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CRSSA can be reached at COMM 908-932-1582; FAX 908-932-8746; or CRSSA, Department of Natural Resources, College Farm Rd.; Cook College, Rutgers University; New Brunswick, NJ, 08903-0231.
LAS can be reached at COMM 514-858-1104; FAX 514-389-9373; LAS Inc.; 1570 Chabanel Ouest; Montreal Canada H1Y 1H1; http://www.las.com.
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